

**Exemption No. 6097**

**UNITED STATES OF AMERICA  
DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

**Ipeco Europe**

**Regulatory Docket No. 28112**

for an exemption from § 25.562(b)(2)  
of the Federal Aviation Regulations

**DENIAL OF EXEMPTION**

By letter IC/A18/IC210/LN dated February 9, 1995, which transmitted petition PD/A18/PD002/LN dated February 10, 1995, Mr. Iain Campbell, Managing Director, Ipeco Europe, Aviation Way, Southend-On-Sea, Essex SS2 6UN, England, petitioned that temporary Exemption No. 5704B from the floor warpage test requirement of § 25.562(b)(2) of the Federal Aviation Regulations (FAR), for Ipeco pilot and co-pilot seats in Dornier model 328 airplanes, be made permanent, only for those DO328 airplanes registered prior to June 30, 1995.

**Section of the FAR affected:**

Section 25.562(b)(2), in prescribing the conditions under which seats must be tested, requires in pertinent part that where floor rails or floor fittings are used to attach the seating devices to the test fixture, the rails or fittings must be misaligned with respect to the adjacent set of rails or fittings by at least ten degrees vertically (i.e., out of parallel) with one rolled ten degrees.

**Related Sections of the FAR:**

Section 25.562(a) requires seats and restraints to be designed to protect occupants subjected to the loads prescribed in § 25.562(b).

Section 25.785(a), as amended by Amendment 25-64, requires that each seat, berth, safety belt, harness, and adjacent part of the airplane at each station designated as occupiable during takeoff and landing must be designed so that a person making proper use of those facilities will not suffer serious injury in an emergency landing as a result of inertia forces specified in §§ 25.561 and 25.562. (Due to a non-substantive editorial change, these requirements are contained in § 25.785(a) and (b) of current part 25.)

**The petitioner's supportive information is as follows:**

Ipeco was awarded a contract from Dornier for the development and supply of pilot/co-pilot seats at a time when the FAA had confirmed via letter dated March 5, 1990, that § 25.562 was to be amended to delete requirements for floor deformation for flight deck seats during the dynamic test procedures.

"With the co-operation of Dornier, we developed and tested a seat design which met all the requirements of § 25.562 with the exception of floor warping. In common with most equipment contracts these days, the full non-recurring costs of design, development, certification and support documentation were carried by Ipeco.

"During 1992, the FAA modified the decision taken by introducing the '40-inch directive' under which smaller, part 25 transports were subject to the floor deformation requirements. Following representations from Dornier and ourselves, the 328 program was granted short-term Exemption No. 5704 before compliance became mandatory, allowing us to deliver products to the non-floor-warped standard in support of our customers' production needs. That exemption currently expires in June of 1995, by which time all seats in service must be modified to a full compliance standard.

"Under contractual commitments, Ipeco has therefore been obliged to bear in full the redesign and re-certification costs of approximately \$500,000 needed to produce a seat fully compliant with § 25.562 including the floor warping requirements. A further sum approaching \$500,000 would be required to effect the extensive modifications to the in-service units by the expiration of the exemption granted, which would entail approximately 80% of the structure of each seat being replaced.

"Production of non-floor-warped seats, identified by -1 (dash one) part number, has now ceased.

"The pilot seats currently on Dornier 328 aircraft, though not fully complying with § 25.562, are unquestionably designed to a far higher performance specification than those of any part 25 aircraft in service. The costs of modification of these in-service seats are out of all proportion to the increased safety benefits which might be gained, and even these remain a matter of debate. The expenditure of these monies would represent a further serious financial loss to our

company, and we ask therefore that the temporary exemption granted be made permanent for those aircraft which have been delivered prior to June 31, 1995, with -1 non-floor-warped seats installed."

"In the text of § 25.562(b)(2) is the condition that 'Where floor rails or floor fittings are used to attach the seating devices to the test fixture, the rails or fittings must be misaligned with respect to the adjacent set of rails or fittings by at least 10 degrees vertically (out of parallel) with one rolled 10 degrees.' " "The seats designed and developed for the Dornier 328 aircraft are individually mounted single seats with both vertical and horizontal adjustments to accommodate different sizes of crew members."

"The specification for the Captain and First Officer's seats was issued to Ipeco Europe at the start of 1990 at which time inquiries were made to the FAA as to the application of the floor track misalignment requirement to flight crew seats. The FAA responded by advising Ipeco that, "the FAA will consider granting exemptions from this requirement [i.e., floor track misalignment]," after stating that, "there is no evidence to indicate that floor buckling has been a significant factor in crew seat failures during survivable crash conditions." (Anthony J. Broderick, FAA, to K. Draper, Ipeco Europe, March 5, 1990.) The letter continued by stating that, "The FAA is initiating rulemaking to amend § 25.562 to delete the requirement to test flight deck seats with floor warpage." Some two years later, the '40-inch directive' was clarified in a letter dated March 31, 1992, from the FAA to C. Barrow of the British Civil Aviation Authority. During this time, the program of manufacture progressed to an advanced stage, with the seats successfully completing certification testing and meeting all the other requirements of §§ 25.561 and 25.562.

"Dornier Luftfahrt GmbH and Ipeco Europe petitioned for a complete exemption from the track misalignment requirement during March of 1993, and were subsequently granted a partial exemption, No. 5704. This period of partial exemption has been extended since then and Exemption No. 5704B now expires June 30, 1995. This allowed aircraft to be fitted with the tested seat until such time that it could be redeveloped to meet all the requirements of §§ 25.561 and 25.562. Ipeco then embarked on a program of redesign and redevelopment which has culminated with a successful series of tests, the report of which has been submitted to the LBA and FAA for their approval, in which a seat significantly different from the original met all the requirements of the regulations.

"The costs incurred by Ipeco in developing this latest standard of seat have been considerable, approaching some \$500,000 but this has been borne in order to fully comply with FAA requirements.

"In the 'Partial Grant of Exemption,' the FAA required retroactive implementation of any design changes. Due to the significant changes made to the seat design, modifications needed to those seats fitted to in service aircraft amounts to some \$500,000. This additional cost represents a

serious financial loss to Ipeco Europe for an increase in safety which, in the words of the 'Partial Grant of Exemption' No. 5704, 'is not significant.' "

#### "Summary

"Ipeco Europe is petitioning for the 'Partial Grant of Exemption' No. 5704 to be made a complete exemption for all U.S.-registered aircraft registered prior to June 30, 1995, for the following reasons:

"(i) There is no evidence to indicate that floor buckling has been a significant factor in crew seat failures during survivable crash conditions.

"(ii) A total exemption will not significantly affect the level of safety provided by the regulations on this small number of aircraft (24).

"(iii) Retroactive implementation of the modifications required to each seat represents a serious financial loss to Ipeco Europe.

"(iv) Although Ipeco Europe has accepted that its understanding of the content of the letter (from Anthony J. Broderick, FAA, to K. Draper, Ipeco Europe) differs from current FAA interpretation, this original understanding was not without justification. Therefore, Ipeco Europe requests an alleviation from the retrofit requirements of the partial exemption in recognition of the costs so incurred."

A summary of Ipeco Europe's petition was published in the Federal Register on March 23, 1995 (60 FR 15320). Three comments were received. One commenter representing an association of airline pilots does not concur with the petitioner, stating the opinion that exempting pilot seats from the floor warpage requirement would result in an inadequate safety margin and expressing the belief that economics should not be an issue in this matter. A second commenter, representing the manufacturer of the airplane in which the petitioner's seats are installed, supports the petitioner. This commenter expressed the opinions that retrofit costs are disproportionately high to the benefit gained and higher than envisioned by Amendment 25-64, that floor distortion would be extremely unlikely, and that the petitioner had made the required effort to obtain FAA guidance at the outset. A third commenter, representing another airplane manufacturing company, also concurs with the petitioner. This commenter asserts that the FAA letter noted by the petitioner declared that exemptions would be available, and the FAA should therefore stand by that asserted declaration. This commenter offers the position that floor buckling in crashes has not been a factor which would support the floor warpage requirement.

#### **The FAA's analysis/summary is as follows:**

Although the FAA's letter of March 5, 1990, may have contributed to the applicants' incorrect belief that full compliance with § 25.562 would not be required, the FAA has long since clarified

its position that full compliance would be required for all applicants subject to the rule. To the extent that any applicant was disadvantaged by reliance on a misunderstanding on this issue, the FAA's previous grants of temporary exemptions, including those to Dornier, have provided adequate opportunity for applicants to bring affected airplanes into compliance without unnecessary expense or disruption. The FAA does not consider that it is in the public interest to grant a permanent exemption that would permanently expose passengers and crew members to a level of safety that is less than that required by the applicable rules.

Cockpit floor characteristics may not be used as a basis for exemption from the floor distortion test requirements of § 25.562(b)(2). The intent behind the rule imposing a misaligned seat fitting test is to assure a certain degree of seat flexibility and retention of seat attachments, and is applied irrespective of any floor requirements or anticipated floor behavior. Any floor structure characterized by a high degree of stiffness and rigidity, and thus unlikely to warp or distort in a survivable crash, may under certain circumstances, rather than being a desirable design feature, instead act to increase crash loading on cockpit occupants by effectively reducing the fuselage crush distance that would otherwise be available to absorb impact forces.

Ipeco asserts that the provided seats, which must be retrofitted with compliant seats, are unquestionably designed to a far higher performance specification than those of any part 25 aircraft in service, and the high costs of retrofitting do not merit the small gain of safety. But, Ipeco does not substantiate the degree of safety inherent in the provided seats relative to the required seats. Indeed, the high costs claimed for retrofitting would suggest that existing seats need a very considerable modification to provide the level of safety required.

Finally, the FAA notes that Ipeco has not offered any reasons why granting their petition would be in the public interest, nor have they included any reasons why the requested exemption would not adversely affect safety or what actions would provide a level of safety equal to that provided by the rule from which exemption is sought, as required by § 11.25(b)(5).

In consideration of the foregoing, I find that a grant of exemption is not in the public interest. Therefore, pursuant to the authority contained in §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, delegated to me by the Administrator (14 CFR 11.53), the petition of Ipeco Europe for an exemption from § 25.562(b)(2) of the FAR for pilot/co-pilot seats in DO328 aircraft registered prior to June 30, 1995, is hereby denied.

Issued in Renton, Washington, on June 2, 1995

/s/

Darrell M. Pederson  
Acting Manager  
Transport Airplane Directorate  
Aircraft Certification Service